[0045] It is likewise possible that the magnet 3 is mounted directly on the pedal 2. However, in most cases the sensor 4 will not be located in the immediate vicinity of the pedal 2, so a transmission of the motion of the pedal must take place in the vicinity of the sensor 4.

[0046] The magnet 3, for which a permanent magnet is preferably used, produces a magnetic field 5, which varies with the position of the magnet 3.

[0047] This magnetic field 5 is detected by the sensor 4 through suitable means 6 inside or on the sensor 4. For example, the sensor 4 can be a Hall sensor whose Hall-sensitive area 6 is suitable for detecting the magnetic field. Preferably, a sensor 4 is used that can detect at least two spatial components of the magnetic field 5 in at least two positions slightly displaced from one another. The gradients are determined from the spatial components of the at least two positions of the magnetic field 5. This preferably occurs in the sensor 4.

[0048] The sensor 4 has an output 7 for providing the sensor signal or signals 8 that is or are transmitted to a processor 9 through an input 10 for reading in the signal 8.

[0049] It is readily possible, however, that the detected spatial components of the magnetic field 5 are provided initially at the output 7 of the sensor 4 and the determination of the gradients takes place in the processor 9.

[0050] From the at least two gradients determined, a position signal is calculated from the angular information. This position signal is only unambiguous in a certain range, so that a position determination on the basis of the position signal alone is not unambiguously possible in a large measurement range. For this reason, a signal strength is additionally calculated from the gradients determined.

[0051] Through a suitable combination of these two signals, it is possible for an output signal 12 that is suitable for the braking demand to be provided at an output 11 of the processor 9.

[0052] FIG. 1a shows a preferred output signal 12. The output signal 12 has at least two position ranges 13, 14, wherein the output signal 12 increases monotonically in the first position range 13. On account of this monotonic slope, the output signal 12 takes on values that are unambiguously associated with a position of the magnet 3 relative to the sensor 4, and thus with a position of the pedal 2.

[0053] A differentiated braking force demand is not necessary in the second position range 14, which, for example, is the range of full braking. It is only necessary that full braking force is called for. For this reason, the output signal 12 takes on a constant value in the second position range 14.

[0054] In FIG. 2, the method according to the claims is explained in detail on the basis of a flowchart.

[0055] As the first step, the magnetic field 5 of the magnet 3 is detected by a sensor 4. This occurs separately according to at least two spatial components. When the detection takes place in at least two positions slightly displaced from one another, a gradient can be determined from each of the detected spatial components of the magnetic field 5.

[0056] It is possible to calculate a position signal from the at least two detected gradients on the basis of an angular relationship. It is likewise possible to calculate a signal strength from the gradients.

[0057] The output signal 12 is generated in accordance with a distinction between cases.

[0058] It is first tested whether the position signal has taken on a value greater than a specified second threshold.

If this is the case, the pedal 2 is in a position that corresponds to the second position range 14, for example in the case of full braking. The constant value is output as output signal 12.

[0059] If the position signal has taken on a value that is smaller than the second threshold, an additional query takes place.

[0060] It is tested whether the signal strength that was determined is below a third threshold. If this is the case, then the pedal 2 is in a position that corresponds to the second position range. The position signal, which was less than the second threshold, can then be attributed to the lack of unambiguity of the position signal, in particular in the second position range 14.

[0061] In this case, too, the constant value is output as output signal 12.

[0062] If, in contrast, the signal strength is above the third threshold, then the pedal 2 is in a position that corresponds to the first position range. A differentiated braking force demand is necessary, which is determined through an unambiguous position of the magnet 3 relative to the sensor 4.

[0063] For this reason, the position signal is output as output signal 12.

[0064] A possible signal curve of the system is shown in FIG. 3.

[0065] Typical gradients that were determined from two spatial components of the magnetic field 5 are shown in part (a).

[0066] The position signal (b) and signal strength (c) are obtained on the basis of the gradients. The characteristic curve of the position signal initially shows a monotonically increasing curve, but then has a jump and yet another increase. This jump makes the characteristic curve ambiguous in the required measurement range.

[0067] Especially in the latter part of the characteristic curve, the signal strength exhibits a monotonically decreasing curve, which makes threshold detection possible.

[0068] From the combination of the position signal and the signal strength, it is possible in accordance with the distinction between cases described in FIG. 2 to generate the desired output signal 12 (part d). The first position range 13 with a monotonically increasing characteristic curve, on the basis of which an unambiguous position of the magnet 3 relative to the sensor 4 can be assigned, is visible, and a second position range 14 in which the output signal 12 takes on a constant value.

[0069] The invention being thus described, it will be obvious that the same may be varied in many ways. Such variations are not to be regarded as a departure from the spirit and scope of the invention, and all such modifications as would be obvious to one skilled in the art are to be included within the scope of the following claims.

What is claimed is:

1. A device for contactlessly determining a position of a pedal in a vehicle, the device comprising:

at least one magnet;

a sensor, the magnet producing a magnetic field that varies with the position of the pedal and is detected by the sensor, the sensor having an output to provide at least one sensor signal; and

a processor, having at least one input for reading in the at least one sensor signal and at least one output for outputting an output signal,